IN THE CLAIMS

1. **(currently amended)** A network management system for managing a network, comprising:

a network decomposition unit which decomposes said network into ~~elements, and groups the elements into network components including at least one core network and branch networks~~at least one core ring network and a plurality of branch networks interconnected with said core ring network;

a ~~table management unit which manages information on decomposition of the network into said network components by tabulating the information on decomposition;~~

~~wherein said~~ table management unit that comprises,

a branch information table for ~~managing table for~~ managing information on structures of said branch networks,

a core information table for managing information on ~~at least one~~ a structure of said ~~at least one~~ core ring network,

a connection information table for managing information on connections between the ~~at least one~~ core ring network and the branch networks,

a protection information table for containing information on protection of channels between nodes in the ~~at least one~~ core ring network, and

a virtual-network generation unit which generates a virtual ring network as a new ring network area to be managed, by combining said ~~network components~~branch networks based on information managed by said table management unit;,

said virtual-network generation unit[[,]] performing:

(a1) checking that designated branch networks are connected to the identical core ring network, where the designated branch networks are branch networks designated by operator,

(a2) checking that link bandwidths of the designated branch networks do not exceed the value of a link bandwidth of the core ring network,

(b1) obtaining branch connection points of the designated branch networks from the branch information table,

(b2) obtaining nodes having the branch connection points in the core ring network from the connection information table,

(b3) obtaining links from the core information table, where the links are physical transmission lines connecting the nodes,

(c) generating subnetwork connections by connecting the branch connection points, the nodes and the links,

(d) removing the subnetwork connections which pass through an identical link from the generated subnetwork connections,

(e) generating the virtual~~-network~~ ring network by connecting the subnetwork connections which pass through different links,

wherein, when a working path is established between the nodes in the core ring network and when there are a plurality of channels between the nodes, said virtual-network generation unit generates the subnetwork connections by preferentially selecting ones of the channels that are not protected in order to avoid double protection by a protection path, based on the protection information table; and

a virtual-network display unit that displays the virtual ring network to be a managed area by concealing the nodes constituting the core ring network.

2. – 3. (canceled)

4. **(currently amended)** The network management system according to claim 1,

wherein said branch information table stores branch numbers indicating said branch

networks, and said virtual-network generation unit automatically generates said virtual <u>ring</u>

network by combining said ones of the branch networks when ones of the branch numbers

corresponding to the ones of the branch networks are externally designated.

5. – 6. (canceled)

7. **(currently amended)** The network management system according to claim 1,

wherein when a branch network is added to said virtual <u>ring</u> network, said virtual-network

generation unit changes a structure of the virtual <u>ring</u> network by determining at least one

path in the virtual <u>ring</u> network which is affected by addition of the branch network,

switching said at least one path to at least one other path, changing subnetwork connections

in one of said at least one core <u>ring</u> network after the switching, and thereafter making

settings for connecting paths to nodes in the added branch network.

8. **(currently amended)** The network management system according to claim 1,

wherein when a branch network is removed from said virtual <u>ring</u> network, said virtual-

network generation unit changes a structure of the virtual <u>ring</u> network by determining at

least one path in the virtual <u>ring</u> network which is affected by removal of the branch network,

switching said at least one path to at least one other path, changing subnetwork connections

in one of said at least one core <u>ring</u> network after the switching, and thereafter removing

subnetwork connections related to said at least one path from nodes in the removed branch

network.

9. **(currently amended)** The network management system according to claim 1, wherein when a node is added to a branch network in said virtual ring network, said virtual-network generation unit changes a structure of the virtual ring network by determining at least one path in the virtual ring network which is affected by addition of the node, switching said at least one path to at least one other path, thereafter making settings for connecting paths to the added node, and adding information on the added node to said branch information table.

10. **(currently amended)** The network management system according to claim 1, wherein when a node is removed from a branch network in said virtual ring network, said virtual-network generation unit changes a structure of the virtual ring network by determining at least one path in the virtual ring network which is affected by removal of the node, switching said at least one path to at least one other path, and thereafter removing information on the removed node from said branch information table.

11. **(currently amended)** The network management system according to claim 1, ~~further comprising a~~wherein said virtual-network display unit which displays said virtual ring network by generating virtual lines based on connections between nodes in said ones of branch networks and subnetwork connections in one of said at least one core ring network which connect the ones of branch networks.

12. (original) The network management system according to claim 11, wherein when a trouble occurs in a link, and a failure of a subnetwork connection is detected, said virtual-network display unit displays information on the failure with one of said virtual lines

corresponding to the subnetwork connection.

13. – 24. **(canceled)**